

AMENDMENT TO THE CLAIMS

1. (Original) An apparatus for routing at least one flow of packets over a network comprising:

(a) a transceiver arranged to receive and forward each packet in a flow of packets;
and

(b) a processor, coupled to the transceiver, that is arranged to perform actions, including:

(i) if at least one received packet in the flow of packets is associated with a traffic manager, forwarding the flow of packets to the associated traffic manager; and

(ii) if each received packet in the flow of packets is unassociated with the traffic manager, performing actions, including:

(A) selecting another traffic manager; and

(B) associating the other traffic manager with the flow of packets,

wherein each received packet in the flow of packets is forwarded to the other traffic manager.

2. (Original) The apparatus of Claim 1, further comprising a memory that is configured to store a connection key associated with at least one received packet in the flow of packets.

3. (Original) The apparatus of claim 1, wherein the processor is arranged to perform actions, further comprising, if at least one received packet in the flow of packets includes at least one connection key associated with at least one traffic manager, storing each connection key and its association with each traffic manager.

4. (Original) The apparatus of claim 3, wherein the connection key further comprises at least one of a source IP address, a destination IP address, a source port, virtual local area network (VLAN) identifier, and a destination port.

5. (Original) The apparatus of claim 1, wherein the processor is arranged to perform actions, further comprising:

(a) receiving a signal from the traffic manager; and

(b) if the signal indicates a memorize instruction, storing the connection key and an association with the other traffic manager.

6. (Original) The apparatus of claim 1, wherein the processor is arranged to perform actions, further comprising:

(a) receiving a signal from the traffic manager; and

(b) if the signal indicates a forget instruction, deleting the association between the connection key and the other traffic manager.

7. (Original) The apparatus of claim 1, wherein the processor is arranged to perform actions, further comprising, aging at least one connection key.

8. (Original) The apparatus of claim 1, further comprising associating the other traffic manager with the connection key, and mirroring the connection key to another processor.

9. (Original) The apparatus of claim 1, wherein the processor includes at least one of a microprocessor, field-programmable gate arrays (FPGA), an application specific integrated chip, digital logic, and software.

10. (Original) The apparatus of claim 1, wherein the apparatus is arranged to operate as at least one of a distributor, a router, a bridge, a firewall, and a gateway.

11. (Original) The apparatus of claim 1, wherein each received packet includes at least one of a media access control address, a virtual local area network (VLAN) identifier, a transmission control protocol (TCP) port number, a user datagram protocol (UDP) port number, an internet protocol (IP) address, a physical port identifier, and a physical port.

12. (Original) A method for routing at least one flow of packets over a network comprising:

(a) if at least one received packet in the flow of packets is associated with a traffic manager, forwarding the flow of packets to the associated traffic manager; and

(b) if each received packet in the flow of packets is unassociated with the traffic manager, performing further actions, including:

(i) selecting another traffic manager; and

(ii) associating the other traffic manager with the flow of packets, wherein each received packet in the flow of packets is forwarded to the other traffic manager.

13. (Original) The method of claim 12, further comprising sending a second signal to a second distributor, in response to detecting a communication protocol signal in packet seen by a first distributor, wherein the second signal instructs the second distributor to age a second association between a second flow of packets and the traffic manager.

14. (Original) The method of claim 12, further comprising, in response to detecting a TCP FIN signal, aging the association between the flow of packets and the traffic manager.

15. (Original) The method of claim 12, wherein associating the other traffic manager with the flow of packets further comprises storing a connection key and an identifier associated with the other traffic manager.

16. (Original) The method of claim 12, wherein associating the other traffic manager with the flow of packets further comprises:

(a) receiving the flow of packets from the other traffic manager;

(b) determining whether a signal is associated with the received flow of packets; and

(c) if the signal indicates a memorize action, storing a connection key and an identifier associated with the other traffic manager.

17. (Original) A system for routing at least one flow of packets over a network, comprising:

(a) a plurality of servers; and

(b) a distributor that is in communication with the plurality of servers, wherein the distributor is arranged to perform actions, including:

(i) if a connection key in at least one received packet in the flow of packets is associated with a traffic manager, forwarding the flow of packets to the traffic manager associated with the connection key; and

(i) if the connection key in each received packet in the flow of packets is unassociated with the traffic manager, performing actions, including:

(A) selecting another traffic manager; and

(B) associating the other traffic manager with the connection key, wherein each received packet in the flow of packets is forwarded to the other traffic manager.

18. (Original) The system of Claim 17, wherein the distributor is arranged to perform further actions, including:

(a) sending a signal to a second distributor, wherein the signal is indicative of the association between the flow of packets and the traffic manager; and

(b) in response to detecting a communication protocol signal in another received packet in the flow of packets, sending a second signal to the second distributor, wherein the second signal is indicative of modifying the association between the flow of packets and the traffic manager.

19. (Original) The system of claim 18, wherein modifying the association further comprises at least one of aging and deleting the association between the flow of packets and the traffic manager.

20. (Original) The system of claim 17, further comprising a plurality of traffic managers arranged to direct a flow of packets to at least one of the plurality of servers.

21. (Original) The system of claim 17, further comprising a plurality of traffic managers coupled to the transceiver, each traffic manager in the plurality of traffic managers is configured to perform actions, including:

(a) receiving each packet in the forwarded flow of packets;

(b) including a signal with each received packet, wherein the signal indicates at least one of a memorize instruction, and a forget instruction; and

(c) forwarding each received packet including the signal to another processor.

22. (Original) The system of claim 17, wherein selecting another traffic manager further comprises basing the selection in part on at least one of a round trip time (RTT), a least connections, a packet completion rate, a quality of service, a traffic management device packet rate, a topology, a global availability, a hop metric, a hash of an address in a received packet, a static ratio, a dynamic ratio, a source IP address, a destination IP address, a port number, and a round robin mechanism.

Claims 23-25 (Canceled)

26. (Previously presented) A method for routing two related flows of packets, including a first flow and a second flow, over a network having a plurality of traffic managers, comprising:

at a distributor:

(a) receiving the first flow of packets in the related flows of packets;

(b) receiving the second flow of packets in the related flows of packets;

(c) forwarding the first flow of packets to a target traffic manager selected from the plurality of traffic managers, wherein the target traffic manager is selected based in part on a first connection key;

(d) forwarding the second flow of packets to the target traffic manager based in part on the second connection key; and

performing load-balancing, including making a determination as to which traffic manager of the plurality of traffic managers to forward packets to based on balancing a load across the plurality of traffic managers.

27. (Original) The method of claim 26, wherein the first flow of packets and second flow of packets further comprise a bi-directional flow of packets wherein the first flow of packets flow in one direction and the second flow of packets flow in a different direction.

28. (Original) The method of claim 26, wherein the first flow of packets is a control flow and the second flow of packets is a data flow.

29. (Original) The method of claim 26, further comprising:

(a) storing an association between the first flow of packets in the related flows of packets and the target traffic manager; and

(b) in response to receiving the second flow of packets in the related flows of packets, employing the association to identify the target traffic manager storing an association between the second flow of packets and the target traffic manager.

30. (Original) The method of claim 26, further comprising:

(a) receiving a packet in the first flow of packets from the target traffic manager;

(b) determining whether a signal is associated with the received packet in the first flow of packets; and

(c) if the signal is a memorize signal, storing the first connection key and an identifier associated with the target traffic manager.

31. (Original) The method of claim 26, further comprising:
- (a) receiving a packet in the first flow of packets from the target traffic manager; and
 - (b) in response to the received packet, storing the first connection key and an identifier associated with the target traffic manager.
32. (Original) An apparatus for routing a flow of packets over a network, comprising:
- (a) a means for receiving and forwarding at least one packet in the flow of packets; and
 - (b) a means for forwarding each received packet in the flow of packets to a traffic manager, wherein the forwarding means determines the traffic manager based in part on a connection key that is associated with the flow of packets such that each forwarded packet in the flow of packets is routed to the same traffic manager.
33. (Previously presented) A method for routing a flow of packets over a network, comprising:
- (a) transmitting a signal, from a traffic manager to a distributor, wherein the signal indicates a processing instruction associated with the flow of packets;
 - (b) receiving the signal at the distributor;
 - (c) receiving, at the distributor, a packet in the flow of packets;
 - (d) processing, at the distributor, the packet based at least in part on the signal;
- transmitting, from the traffic manager to the distributor, a first partial server-side connection key corresponding to another flow of packets, wherein the first partial server-side connection key includes known fields and unknown fields;

learning, at the distributor, of a second partial server-side connection key which includes fields corresponding to unknown fields of the first partial server-side connection key;

storing, at the distributor, an association between the second partial server-side connection key and the traffic manager associated with the flow of packets for use in forwarding packets of said another flow of packets; and

making a determination as to whether or not to age the second partial server-side connection key.

34. (Original) The method of Claim 33, wherein receiving the signal at the distributor further comprises storing a mapping between the flow of packets and the traffic manager.

35. (Original) The method of Claim 33, wherein processing the packet further comprises forwarding the packet to the traffic manager.

36. (Previously presented) A method for routing a flow of packets over a network, comprising:

(a) receiving, from a target traffic manager, a signal representing a processing instruction associated with the flow of packets;

(b) receiving, a packet in the flow of packets; and

(c) processing the packet based at least in part on the signal representing the processing instruction.

37. (Original) The method of Claim 36, further comprising, in response to receiving the signal, storing a mapping between the flow of packets and the target traffic manager.

38. (Original) The method of Claim 36, further comprising:

(a) in response to receiving the signal, storing a mapping between the flow of packets and the target traffic manager;

(b) receiving from the target traffic manager, another signal associated with the flow of packets, wherein the other signal represents another processing instruction associated with the flow of packets; and

(c) in response to receiving the other signal, deleting the mapping between the flow of packets and the target traffic manager.

39. (Original) The method of Claim 36, wherein processing the packet further comprises forwarding the packet to the target traffic manager.

40. (Original) The method of Claim 36, wherein receiving the signal further comprises receiving, from the target traffic manager, the signal together with another packet.

41. (Original) The method of Claim 36, wherein receiving the packet further comprises receiving the packet from a client device, and wherein receiving the signal further comprises receiving the signal together with another packet addressed to the client device.

42. (Original) The method of Claim 36, further comprising in response to receiving the signal, sending the processing instruction to a distributor.

Claims 43-46 (Canceled)

47. (Previously presented) An apparatus for routing a plurality of packet flows over a network comprising:

(a) a transceiver arranged to receive and forward each packet in the plurality of packet flows;

(b) an interface, coupled to the transceiver, and arranged to perform actions, including:

(i) receiving an instruction;

(ii) if the instruction is a memorize instruction, storing a mapping between a designated packet flow in the plurality of packet flows and a target network device;

(iii) if the instruction is a delete instruction, deleting the mapping between the designated packet flow in the plurality of packet flows and the target network device; and
performing load-balancing, including making a determination as to which traffic manager of a plurality of traffic managers to forward packets to based on balancing a load across the plurality of traffic managers.

48. (Original) The apparatus of Claim 47, wherein the interface is arranged to perform further actions, including, if the instruction is a mirror instruction, mirroring the mapping between the designated packet flow and the target network device.

Claims 49-51 (Canceled)

52. (Previously presented) A method for routing a first flow of packets and a second flow of packets that is related to the first flow of packets, over a network comprising:

- (a) at a first distributor, associating the first flow of packets with a traffic manager;
 - (b) at the first distributor, associating the second flow of packets with the traffic manager;
 - (c) in response to detecting a signal in the first flow of packets, aging the association between the second flow of packets and the traffic manager; and
- performing load-balancing, including making a determination as to which traffic manager of a plurality of traffic managers to forward packets to based on balancing a load across the plurality of traffic managers.

53. (Original) The method of claim 52, wherein the signal further comprises a TCP protocol signal.

54. (Original) The method of claim 52, wherein the signal further comprises a TCP FIN.

55. (Original) The method of claim 52, further comprising:

- (a) storing a sequence number corresponding to the first flow of packets; and
- (b) employing the sequence number to determine whether the signal is a valid FIN signal.

56. (Previously presented) The method of claim 52, further comprising, in response to detecting the signal, in the first distributor, sending a second signal to a second distributor, wherein the second signal instructs the second distributor to age the second flow of packets.

57. (Previously presented) The apparatus of Claim 1, wherein the processor is arranged to perform further action, including:

- receiving, from the traffic manager associated with the flow of packets, a first partial server-side connection key corresponding to another flow of packets, wherein the first partial server-side connection key includes known fields and unknown fields;

- learning of a second partial server-side connection key which includes fields corresponding to unknown fields of the first partial server-side connection key; and

- storing an association between the second partial server-side connection key and the traffic manager associated with the flow of packets for use in forwarding packets of said another flow of packets.

58. (Previously presented) The apparatus of Claim 57, wherein the processor is arranged to learn of the second partial server-side connection key by receiving packets containing the unknown fields of the first partial server-side connection key, and generating the second partial server-side connection key from the packets containing the unknown fields.

59. (Previously presented) The apparatus of Claim 57, wherein the processor is arranged to learn of the second partial server-side connection key by receiving packets from said another flow of packets and receiving the second partial server-side connection key from the traffic manager associated with the flow of packets.

60. (New) An apparatus for routing at least one flow of packets over a network comprising:
- (a) a transceiver arranged to receive and forward each packet in a flow of packets;
- and
- (b) a processor, coupled to the transceiver, that is arranged to perform actions, including:
 - (i) each time a flow of packets is received in which at least one packet in the flow of packet is associated with a traffic manager, forwarding the flow of packets to the associated traffic manager; and
 - (ii) each time a flow of packets is received in which each received packet in the flow of packets is unassociated with the traffic manager, performing actions, including:
 - (A) selecting another traffic manager; and
 - (B) associating the other traffic manager with the flow of packets,wherein each received packet in the flow of packets is forwarded to the other traffic manager.
61. (New) The apparatus of claim 60, wherein the processor is arranged to perform actions, further comprising, each time a flow of packets is received in which at least one packet in the flow of packet is associated with a traffic manager, storing each connection key and its association with each traffic manager.
62. (New) The apparatus of claim 60, wherein the processor is arranged to perform actions, further comprising:
- receiving a signal from the traffic manager; and
 - upon receiving a signal indicating a memorize instruction, storing the connection key and an association with the other traffic manager.
63. (New) The apparatus of claim 60, wherein the processor is arranged to perform actions, further comprising, aging at least one connection key.

64. (New) An manufacture including a processor-readable medium having processor-executable code stored therein, which when executed by one or more processors, enables actions for routing at least one flow of packets over a network, comprising:

each time a flow of packets is received in which at least one packet in the flow of packet is associated with a traffic manager, forwarding the flow of packets to the associated traffic manager; and

each time a flow of packets is received in which each received packet in the flow of packets is unassociated with the traffic manager, performing actions, including:

selecting another traffic manager; and

associating the other traffic manager with the flow of packets, wherein each received packet in the flow of packets is forwarded to the other traffic manager.

65. (New) The manufacture of Claim 64, the actions further comprising sending a second signal to a second distributor, in response to detecting a communication protocol signal in packet seen by a first distributor, wherein the second signal instructs the second distributor to age a second association between a second flow of packets and the traffic manager.

66. (New) The manufacture of Claim 64, the actions further comprising, in response to detecting a TCP FIN signal, aging the association between the flow of packets and the traffic manager.

67. (New) The manufacture of Claim 64, wherein the processor-executable code, when executed by one or more processors, performs the action of associating the other traffic manager with the flow of packets such that the action of associating the other traffic manager with the flow of packets includes storing a connection key and an identifier associated with the other traffic manager.

68. (New) The manufacture of Claim 64, wherein the processor-executable code, when executed by one or more processors, performs the action of associating the other traffic manager

with the flow of packets such that the action of associating the other traffic manager with the flow of packets includes:

- receiving the flow of packets from the other traffic manager;
- determining whether a signal is associated with the received flow of packets; and
- upon receiving a signal indicating a memorize instruction, storing the connection key and an association with the other traffic manager.

69. (New) A method for routing at least one flow of packets over a network comprising:

- each time a flow of packets is received in which at least one packet in the flow of packet is associated with a traffic manager, forwarding the flow of packets to the associated traffic manager; and
- each time a flow of packets is received in which each received packet in the flow of packets is unassociated with the traffic manager, performing actions, including:
 - selecting another traffic manager; and
 - associating the other traffic manager with the flow of packets, wherein each received packet in the flow of packets is forwarded to the other traffic manager.

70. (New) The method of claim 69, further comprising sending a second signal to a second distributor, in response to detecting a communication protocol signal in packet seen by a first distributor, wherein the second signal instructs the second distributor to age a second association between a second flow of packets and the traffic manager.

71. (New) The method of claim 69, further comprising, in response to detecting a TCP FIN signal, aging the association between the flow of packets and the traffic manager.

72. (New) The method of claim 69, wherein associating the other traffic manager with the flow of packets further comprises storing a connection key and an identifier associated with the other traffic manager.

73. (New) The method of claim 69, wherein associating the other traffic manager with the flow of packets further comprises:

- receiving the flow of packets from the other traffic manager;
- determining whether a signal is associated with the received flow of packets; and
- upon receiving a signal indicating a memorize instruction, storing the connection key and an association with the other traffic manager.